5 FAH-8 H-500
ACCESSIBILITY AND USABILITY

5 FAH-8 H-510
ACCESSIBILITY (SECTION 508)

(CT:WEB-1; 09-29-2005)
(Office of Origin: IRM/BPC/RG)

5 FAH-8 H-511 COMPLIANCE (SECTION 508)

(CT:WEB-1; 09-29-2005)

The Impact Office (IRM/BPC/BC) provides a resource to evaluate Web pages for Section 508 compliance. Developers are encouraged to make use of this resource.

5 FAH-8 H-512 ACCESSIBILITY

(CT:WEB-1; 09-29-2005)

a. Accessibility is the degree with which persons with disabilities can gain access and use the information contained on a Web site. Although disabilities are frequently thought of as being visual or physical, a Web designer must also consider user bias in perception, user ability to decode complex patterns, attention deficiencies, auditory deficiencies, and hardware capability.

b. In some cases, technology can be used to compensate for a physical disability; however, technology solutions require a PC and frequently the PCs provided to persons with disabilities are not as capable as the state-of-the-art systems that are being used to develop Web pages. Unfortunately, cutting edge technology can also create new problems for persons with disabilities. The black and white monitor on a cellular phone is a hardware feature that simulates the condition of total color blindness. When providing alternative means to access a Web site, the developer must find the least common denominator among hardware, peripherals and/or special devices, and software applications.

c. Perception or an assumption based on one's experience can make a site inaccessible, not because a user cannot see or hear the content, but because the user's mind is closed. This can be caused by emotionally charged words, images, or concepts. The scope of a Web site audience is worldwide and the Web developer must be alert for situations where seemingly innocent content may result in an unwanted response.

d. Attention deficit problems can lead to inaccessibility of a Web site. A site that is too complex to be quickly understood or so dry that it "puts one to sleep" will adversely affect a person with an attention deficit problem. Web pages should be kept short and simple whenever possible.

5 FAH-8 H-513 ACCESSIBILITY STANDARDS

(CT:WEB-1; 09-29-2005)

The Architectural and Transportation Barriers Compliance Board (the Access Board) interprets 36 CFR Section 1194.22 (a) through (k) as consistent with the priority 1 checkpoints of the Web Content Accessibility Guidelines 1.0 (WCAG 1.0) (May 5, 1999) published by the World Wide Web Consortium (W3C) Web Accessibility Initiative. 36 CFR Section 1194.22 (l) through (p) are not priority 1 checkpoints in WCAG 1.0 and must be addressed separately by the Department of State Web site developers.

Section 1194.22 Paragraph	WCAG 1.0 Checkpoint
(a)	1.1
(b)	1.4
(c)	2.1
(d)	6.1
(e)	1.2
(f)	9.1
(g)	5.1
(h)	5.2
(I)	12.1
(j)	7.1
(k)	11.4

5 FAH-8 H-514 STATUTORY REQUIREMENTS

(CT:WEB-1; 09-29-2005)

The following requirements, collectively known as Section 508, are

mandatory on all Department of State Web sites. Although examples are provided to demonstrate possible ways to satisfy each requirement, they are not the only acceptable solutions.

5 FAH-8 H-514.1 Alternative Text Descriptions

(CT:WEB-1; 09-29-2005)

a. "A text equivalent for every non-text element shall be provided (e.g., via 'alt', 'longdesc', or in element content)." (36 CFR § 1194.22(a)).

b. Text equivalent means providing words to describe a non-text element. In cases where the non-text element triggers an action, the description must also indicate what that action is. An example of an active element is a link that is depicted as an image rather than words. Non-text elements include items such as applets, images, image maps, frames, video files, and audio files.

c. The alt parameter is used with the <applet>, <area>, <img>, <embed>, <object>, and <input> tags to provide a short description of the element. The alt parameter text shows on the screen when the mouse is focused on the element.

Example:

```
<img src="Seal.gif" alt="Picture of the Department seal">
```

The descriptive text should be less than seventy (70) characters long. Images that do not provide content such as spacers, bullets, and arrows should use `alt=""` to they will be ignored by adaptive devices.

d. Unimportant graphics (i.e., spacer gifs) should have an ALT tag, but no description (`alt=""`).

e. The longdesc (url) parameter is used with the <img>, <frame>, and <iframe> tags to provide a detailed description of the element. Unlike the alt parameter, the long description does not display on the screen. It is available to screen readers and other forms of assistive technologies; however, some screen readers have a 150-character limit.

Example:

```
<img src="Seal.gif" longdesc="http://www.state.gov/eagle_desc.html">
```

f. When the description exceeds 150 characters, an alternative method is a descriptive link. Making it the same color as the background will hide the descriptive link from view while allowing a screen/Braille reader to identify it.

Example:

```
<style>
a.hide {
  color: #FFFFFF;
}
</style>

<img src="Seal.gif" alt="Picture of the Department seal">
<a class="hide"
href="http://www.state.gov/eagle_desc.html">Description of the
Department seal</a>
```

g. The alternative to using either parameter is to provide a description of the element as part of the Web page or in the case of an <applet>, within the applet tags.

Example 1:

```
<p>The State Department Seal consists of the Great Seal of the
United States with a ring around it. The ring in this view is
simulated by the words &quot;Department of State United States of
America.&quot;</p>
<img src="Seal.gif">
```

The State Department Seal consists of the Great Seal of the United States with a ring around it. The ring in this view is simulated by the words "Department of State United States of America."

Example 2:

```
<applet code="travelapplet.class" width="200", height="100"
alt="This applet displays current travel restrictions for the
selected country">
</applet>
```

h. Audio and video files can be displayed separately and not qualify under the multimedia requirements, however; they are still non-text elements

and need alternate text equivalents. For audio files, there should be a link to a text translation. Animated video files should have a long description attached to explain what action is taking place and why it is important to the Web page. Inanimate video files, for example a Power Point presentation, which may not be able to be interpreted by adaptive technology, should have alternate text attached to each page.

5 FAH-8 H-514.2 Alternative Text Pages

(CT:WEB-1; 09-29-2005)

a. "A text-only page, with equivalent information or functionality, shall be provided to make a Web site comply with the provisions of this part, when compliance cannot be accomplished in any other way. The content of the text-only page shall be updated whenever the primary page changes." (36 CFR § 1194.22(k)).

b. In some cases, the content of a page may require the Web designer to use features that cannot be made accessible even using assistive technologies. If this situation occurs, the Web designer must include a link to a text-only alternate page that will allow full access to people with disabilities. The text-only page must contain equivalent information or functionality as the primary pages and must be updated as often as the primary page.

c. To ensure a Web site is accessible, Web designers should consider enlisting the aid of someone who is familiar with assistive technologies to test the pages. This should be done with a text-only browser such as Lynx, which may be used to ensure the text-only pages are understandable. The IRM IMPACT office can provide assistance in validating this requirement.

5 FAH-8 H-514.3 Multimedia Presentations

(CT:WEB-1; 09-29-2005)

a. "Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation." (36 CFR § 1194.22(b)).

b. The evolution of multimedia technologies allows presentations, short movies, other content with synchronized audio and video tracks, and real time programming in the form of streaming audio and video. While the combining of multiple senses, such as hearing and vision, may make a Web page more interesting for people without disabilities, it presents new challenges when making the page accessible to people with disabilities.

c. Captioning for the audio portion and audio description of visual information of multimedia presentations are considered equivalent alternatives. This provision requires that when an audio portion of a multimedia production is captioned, as required in provision (a) (see 5 FAH-8 H-514.1 Alternative Text Descriptions), the captioning must be synchronized with the audio. Synchronized captioning is required so someone reading the captions can also watch the speaker and associate relevant body language with the speech.

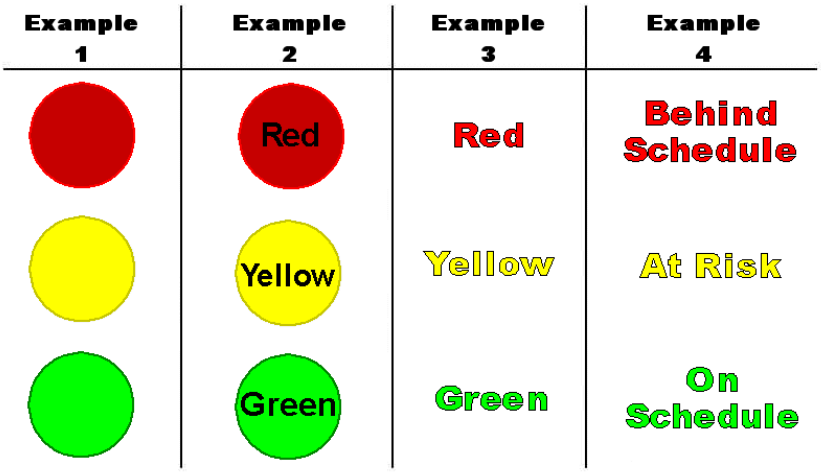
5 FAH-8 H-514.4 Use Of Color

(CT:WEB-1; 09-29-2005)

a. "Web pages shall be designed so that all information conveyed with color is also available without color, for example from context or markup." (36 CFR § 1194.22(c)).

b. Color deficiency falls primarily into two categories, red/green and yellow/blue, while total color blindness or the ability to see only shades of gray is very rare. The vast majority of color deficient persons experience problems with red/green discrimination. Maps and charts, as well as their legends, are problem areas related to the inability to distinguish colors or shades of colors.

c. Exclusive use of "stop light" colors to show the status of a project is inappropriate. Example 1 is unacceptable. Examples 2 and 3 are marginally acceptable. There is a contrast problem between the black text and the background colors for the red and green circles in example 2, and the color names convey no meaning in example 3. Example 4 provides the best solution to concurrent content and color presentation.



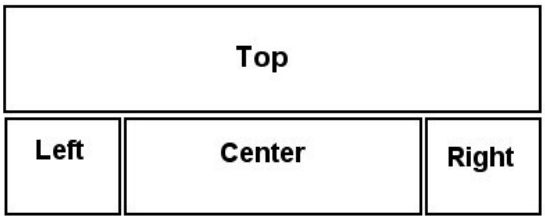
5 FAH-8 H-514.5 Style Sheets

(CT:WEB-1; 09-29-2005)

a. "Documents shall be organized so they are readable without requiring an associated style sheet." (36 CFR § 1194.22(d)).

b. Some browsers allow the user to specify a default style sheet. Information contained in that style sheet set the screen size, text size and color options to facilitate viewing of Web pages. A Web page that overrides the local options may make the page inaccessible through interference with the user's ability to view the page. Web page designers must ensure that their Web pages do not interfere with user-defined style sheets.

c. Style sheets, not tables, should be used to create the basic layout of the Web site. A Web site that has a top banner and three columns



can be defined by:

```
#top {
  width: 100%;
  bottom: 50px;
}
```

Creates a box aligned at the top of the screen, 50 pixels high by the full width of the monitor.

```
#left {
  position: absolute;
  left: 0px;
  width: 10%;
}
```

Creates the left column starting at the left edge of the monitor and 55 pixels from the top. The width is 10% of the monitor.

```
#right {
  position: absolute;
  right: 0px;
  width: 10%;
}
```

Creates the right column starting at the right edge of the monitor and 55 pixels from the top. The width is 10% of the monitor.

```
#center {
  position: absolute;
  left: 10%;
  width: 80%;
}
```

Creates the center column starting 10% from the left edge of the monitor and 55 pixels from the top. The width is 80% of the monitor.

and used on a Web page by:

```
<body>
<div id="top">
   <!-- banner images and/or text -->
</div>
<div id="left">
   <!-- left column information -->
</div>
<div id="right">
   <!-- right column information -->
</div>
<div id="center">
   <!-- center column information -->
</div>
</body>
```

5 FAH-8 H-514.6 Image Maps

(CT:WEB-1; 09-29-2005)

a. "Redundant text links shall be provided for each active region of a server-side image map." (36 CFR § 1194.22(e)).

b. "Client-side image maps shall be provided instead of server-side image maps except where the regions cannot be defined with an available geometric shape." (36 CFR § 1194.22(f)).

c. Image maps are graphic images with one or more regions defined to act as a link or to initiate a script. The example demonstrates two features that must be included with an image map.

   (1) Alternative text descriptions must be defined for each active region of the map. This is accomplished by including the alt parameter in the area tags that define the active areas. To account for inactive areas the <img> tag (first line in the example) should also include an alt parameter. The alternate text description for the "Level 1" image map area is shown in the white block on the illustration.

   (2) A redundant list of links associated with the image map must be included to accommodate assistive technologies that do not recognize the image map. To avoid confusion the redundant list should be located adjacent to or immediately below the image map.

   Example:

```
<img src="OrgChart.jpg" usemap="#org_map" ismap
  alt="Organizational Chart">

<dir>
```

```
  <a href="#L1">Level 1 description</a><br>
  <a href="#L2a">Level 2a description</a><br>
  <a href="#L2b">Level 2b description</a><br>
  <a href="#L3a1">Level 3a1 description</a><br>
  <a href="#L3a2">Level 3a2 description</a><br>
  <a href="#L3b1">Level 3b1 description</a><br>
  <a href="#L3b2">Level 3b2 description</a>
</dir>

<!-- Organization Chart image map -->
<map name="org_map">
  <area shape="rect" coords="8,8,62,35" href="#L1"
    alt="Link to Level 1 description">
  <area shape="rect" coords="98,54,156,82" href="#L2a"
    alt="Link to Level 2a description">
  <area shape="rect" coords="98,148,156,176" href="#L2b"
    alt="Link to Level 2b description">
  <area shape="rect" coords="202,31,259,60" href="#L3a1"
    alt="Link to Level 3a1 description">
  <area shape="rect" coords="202,77,259,106" href="#L3a2"
    alt="Link to Level 3a2 description">
  <area shape="rect" coords="202,127,259,156" href="#L3b1"
    alt="Link to Level 3b1 description">
  <area shape="rect" coords="202,173,259,202" href="#L3b2"
    alt="Link to Level 3b2 description">
</map>
```

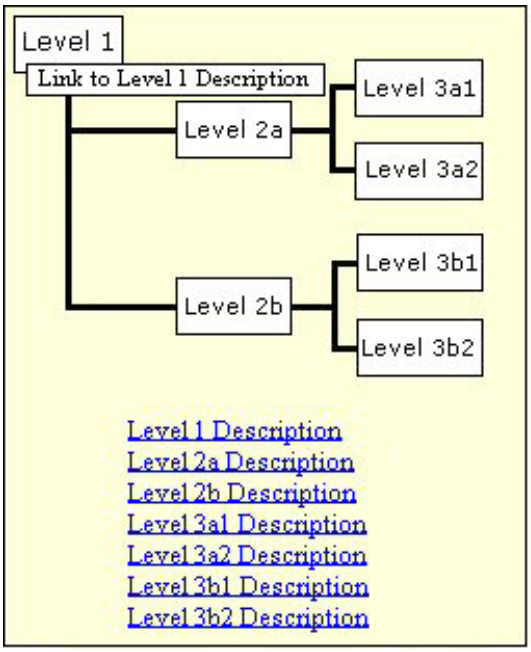


Image Map

Redundant Link List

The form of an image map called a server-side image map is characterized by identifying where on the viewer's screen an image will appear and the server generating the points that are used to identify the active areas. Undesirable features of this method include extra time required for the

server to generate the points and the inability to use alternate text descriptions. To avoid problems associated with interpreting server-side image maps, they must not be used on Department of State Web sites.

5 FAH-8 H-514.7 Tables

(CT:WEB-1; 09-29-2005)

a. Row and column headers shall be identified for data tables. (36 CFR § 1194.22(g)).

b. Markup shall be used to associate data cells and header cells for data tables that have two or more logical levels of row or column headers. (36 CFR § 1194.22(h)).

c. Tables were designed to display numeric or textual data in tabular form. They were not intended to be a tool for graphical design of a Web page. Web site developers should use style sheets (5 FAH-8 H-514.5) as an alternative to complex series of nested tables for defining the graphic layout of the Web site.

d. Do not use <pre> to format a table. Screen readers cannot identify a table structure from the stream of characters in the preformatted text and will not be able to associate row and column relationships for the vision impaired user.

e. Use either the "scope" attribute or the "id" and "header" attributes to associate table cells with the row and column headings.

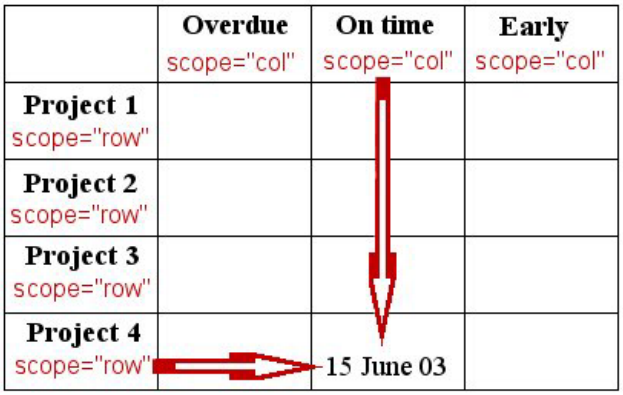
f. "Scope" attributes are identified in the column headings (**<th>** tags) and in the first column of each row (**<td>** tags). They are entered only once for each column or row.

```
<table>
<tr>
  <th> </th>
  <th scope="col">Overdue</th>
  <th scope="col">On time</th>
  <th scope="col">Early</th>
</tr>
<tr>
  <td scope="row">Project 1</td>
  <td>date</td><td>date</td><td>date</td>
</tr>
<tr>
  <td scope="row">Project 1</td>
  <td>date</td><td>date</td><td>date</td>
</tr>
```

```
<tr>
  <td scope="row">Project 1</td>
  <td>date</td><td>date</td><td>date</td>
</tr>
<tr>
  <td scope="row">Project 1</td>
  <td>date</td><td>15 June 03</td><td>date</td>
</tr>
</table>
```

Example:

The scope attributes associate the date with "Project 1" and "On time".



The "id" and "header" attributes perform the same function as "scope" attributes but are more complicated to use. A unique "id" attribute must be entered for each column and row. Each cell must include a "header" attribute showing the value of the associated column and row ids.

```
<table>
<tr>
  <th> </th>
  <th id="overdue">Overdue</th>
  <th id="ontime">On time</th>
  <th id="early">Early</th>
</tr>
<tr>
  <td id="proj1">Project 1</td>
  <td headers="proj1 overdue">date</td>
  <td headers="proj1 ontime">date</td>
  <td headers="proj1 early">date</td>
</tr>
<tr>
  <td id="proj1">Project 2</td>
  <td headers="proj2 overdue">date</td>
  <td headers="proj2 ontime">date</td>
  <td headers="proj2 early">date</td>
</tr>
<tr>
```

```
  <td id="proj1">Project 3</td>
  <td headers="proj3 overdue">date</td>
  <td headers="proj3 ontime">date</td>
  <td headers="proj3 early">date</td>
</tr>
<tr>
  <td id="proj1">Project 4</td>
  <td headers="proj4 overdue">date</td>
  <td headers="proj4 ontime">15 June 03</td>
  <td headers="proj4 early">date</td>
</tr>
</table>
```

5 FAH-8 H-514.8 Frames

(CT:WEB-1; 09-29-2005)

a. Frames shall be titled with text that facilitates frame identification and navigation. (36 CFR § 1194.22(i)).

b. To ensure that Web pages using frames are accessible to people with disabilities, designers should use the title attribute to provide meaningful titles to each of the frames so users can properly orient themselves. Otherwise, those who use screen readers or other assistive technologies will be unable to fully understand the relationships among multiple frames on the same page.

c. A <NOFRAME> option must be provided whenever a <FRAME> is used. Where appropriate, the <NOFRAME> option should provide links to standalone versions of the <FRAME> content.

5 FAH-8 H-514.9 Screen Flicker

(CT:WEB-1; 09-29-2005)

a. Pages shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz. (36 CFR § 1194.22(j)).

b. The condition to which this requirement pertains is called photosensitive epilepsy. It occurs in less than 5% of people afflicted with epilepsy with the onset occurring below the age of twenty years old. It can be triggered by either natural or artificial light flashing in the range of 2-59 flashes per second.

c. Although the most common cause of a seizure is a television set, the TV characteristics that can precipitate a seizure do not extend to the video

display unit (VDU) or computer monitor. Computer monitors have scan frequencies above 60 Hz and liquid crystal displays (LCD) are flicker free. The actual risk depends on the material being displayed and is added through innovations such as animated gif's, Java applets, and third-party applications.

d. Web page developers must not use strobe light effects or animations which flicker or flash at rates between 2 and 59 flashes per second. This includes but is not limited to changing from dark to light, changing between different colors or patterns, and oscillating motion of an image. In addition to animation, the <BLINK> and <MARQUEE> tags can cause a strobing effect and should be avoided.

5 FAH-8 H-514.10 Scripts And Plug-ins

(CT:WEB-1; 09-29-2005)

a. When pages utilize scripting languages to display content, or to create interface elements, the information provided by the script shall be identified with functional text that can be read by assistive technology. (36 CFR § 1194.22(l)).

b. When a Web page requires that an applet, plug-in or other application be present on the client system to interpret page content, the page must provide a link to a plug-in or applet that complies with (36 CFR § 1194.21(a) through (l)). (36 CFR § 1194.22(m)).

c. Scripts; **including but not limited to ASP, JavaScript, PERL, PHP, and VB script; must be designed to meet the requirements of 5 FAH-8 H-514.10 a**. One of the major problems with scripts is the inability to provide meaningful information about the script's functionality. Frequently, the simple solution is the easiest and best method to provide accessibility.

(1) Calling a function as a link allows a screen reader to tell the user what is happening.

```
<a href="javascript:myFunction();">Start myFunction</a>
```

(2) The same code done with an image does not provide the same information

```
<a href="javascript:myFunction();"><img
   src="myFunction.gif"></a>
```

unless a meaningful description is included in either the <img> "alt" attribute or the <a> "title" attribute.

```
<a href="javascript:myFunction();">
```

```
<img src="myFunction.gif" alt="picture link for starting
   myFunction"></a>
<a title="this link starts myFunction"
href="javascript:myFunction();">
<img src="myFunction.gif"></a>
```

d. Not all event handlers are supported by screen readers, and there is no standardization among those that are supported.

OnClick	Do not use the onClick event handlers for form elements that include several options (e.g., select lists, radio buttons, checkboxes)
OnMouseOver OnMouseOut	Neither event handler interferes with accessibility; however, if the effect (e.g., rollover gif) provides significant information, an alternate way to communicate that information must be available.
onChange	Do not use the onChange event handlers for triggering JavaScript functions based on a selection from within a <select> tag. If necessary to run a function based on a specific selection, use the OnClick event handler associated with a link or button placed adjacent to the <select> tag.

e. Plug-ins provide common ways for Web developers to display different media, e.g., Acrobat Reader to display .pdf files and Real Audio to play audio and video files. Web developers must ensure that any plug-ins required to access Web page content are compliant with accessibility standards. Non-compliant plug-ins must not be used. Web developers must also provide a link to the source of each required plug-in.

f. Plug-ins used on OpenNet+ must be approved by the IT Change Control Board (IT CCB).

5 FAH-8 H-514.11 Forms

(CT:WEB-1; 09-29-2005)

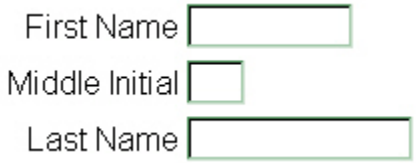
a. When electronic forms are designed to be completed on-line, the form shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues. (36 CFR § 1194.22(n)).

b. Users must be able to complete all forms by using any one of multiple input devices, at least one of which must be the keyboard, and using assistive technology. Web developers should exercise caution when using

scripts to alter the content of functionality of a form or to automatically submit a form. Intrinsic events such as "onClick" and "onFocus" can produce confusing results for a user who is not able to fully comprehend them.

c. The first technique to accessible forms is the physical layout on the page.

d. The three data elements placed side-by-side can be confusing as a screen reader will tell you the label of all three blocks at once rather than identifying them individually. A better physical layout is:



e. To ensure the blocks are correctly identified, each one should have an associated label tag. This is done by adding an "id" parameter to the form elements (<input> in this example) and enclosing the descriptive text with a <label> tag.

```
<table>
<tr>
  <td align="right"><label for="block1">First Name</label></td>
  <td><input id="block1" type="text" name="fname" size="15"></td>
</tr>
<tr>
  <td align="right"><label for="block2">Middle Initial</label></td>
  <td><input id="block2" type="text" name="mi" size="15"></td>
</tr>
<tr>
  <td align="right"><label for="block3">Last Name</label></td>
  <td><input id="block3" type="text" name="lname" size="15"></td>
</tr>
</table>
```

f. In some cases, groups of form elements are associated with sets of data. To indicate the relationship, use the <fieldset> tag with a <legend> tag.

```
<table>
<tr>
  <td align="right"><label for="block1">Bureau</label></td>
  <td><input id="block1" type="text" name="bureau" size="15"></td>
</tr>
<tr>
  <td align="right"><label for="block2">Office Symbol</label></td>
  <td><input id="block2" type="text" name="office" size="15"></td>
</tr>
<tr>
```

```
  <td align="right"><label for="block3">Project Name</label></td>
  <td><input id="block3" type="text" name="project" size="15"></td>
</tr>
<tr>
  <td colspan="2">
  <fieldset>
    <legend>Current Status</legend>
    <br>
    <input id="green" type="radio" name="status" value="On
Schedule">
    <label for="green">On Schedule</label>
    <br>
    <input id="yellow" type="radio" name="status" value="At Risk">
    <label for="green">At Risk</label>
    <br>
    <input id="red" type="radio" name="status" value="Behind
Schedule">
    <label for="red">Behind Schedule</label>
  </fieldset>
  </td>
</tr>
</table>
```

Bureau
Office Symbol
Project Name
Current Status
On Schedule
At Risk
Behind Schedule

g. In addition to an accessible layout, clear and understandable instructions must be provided for entering data on each form. On simple forms, the instructions can be placed at the top of the form. The instructions for more complex forms should be divided into logical units and each unit placed near the associated input fields.

h. Department of State Web pages will not use javascript jump menus for linking to other pages. Script menus are not keyboard accessible because the user cannot scroll through the list. Menus generated by other scripting languages should be tested to ensure they can be accessed by people using assistive technology and through any one of multiple input devices, including the keyboard.

5 FAH-8 H-514.12 Repetitive Navigation Links

(CT:WEB-1; 09-29-2005)

a. A method shall be provided that permits users to skip repetitive navigation links. (36 CFR § 1194.22(o)).

b. Repetitive navigation links are typically found in a column on the left side of the Web page or in a row near the top of the page. The lists of links are repeated on all pages of the Web site to facilitate moving directly to new subject areas and are processed by the screen reader on each page.

c. A style sheet entry setting the text color the same as the background color provides the ability to hide the navigation link so only the screen reader will recognize it.

```
a.hide {
      color: #FFFFFF;
}
```

d. The link to skip the repetitive navigation points to an anchor at another location on the Web page.

```
<a class="hide" href="#text" title="Skip navigation">Skip
navigation</a>.
.
.
.
<a name="text"></a>
```

5 FAH-8 H-514.13 Timed Responses

(CT:WEB-1; 09-29-2005)

a. When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required. (36 CFR § 1194.22(p)).

b. In a slide show where each slide is set to display for a fixed period of time, a visually challenged person may not be able to understand the alternate description in the time allowed.

c. When a Web page or web based application is set to "time out," designers must alert the user before the time expires and give him/her an opportunity to request additional time.

5 FAH-8 H-515 THROUGH H-519 UNASSIGNED